MONITORING WELL INSTALLATION REPORT PIEDMONT LANDFILL & RECYCLING CENTER KERNERSVILLE, NORTH CAROLINA

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December 16, 1994

Mr. Edward Gibson Piedmont Landfill and Recycling Center 9900 Freeman Road Kernersville, North Carolina 27284

Subject:

Monitoring Well Installation Report for System Upgrade

Piedmont Landfill and Recycling Center

Kernersville, North Carolina RUST Project No. 32066.200

Dear Mr. Gibson:

The following report describes the additional well installation for the ground-water monitoring system upgrade at the landfill. We appreciate this opportunity to work with you, and if you should have any questions please do not hesitate to call me at (803) 234-2261.

Sincerely,

Peter J. Walls, P.G., P.E. Senior Geological Engineer

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#### 1.0 INTRODUCTION

Waste Management of Carolinas, Inc. (WMCI) operates the Piedmont Landfill and Recycling Center (PLRC). PLRC is located approximately ten miles north of Kernersville, North Carolina, in the northeast corner of Forsyth County. Access to the site is by Goodwill Church - Freeman Road. The current operating landfill occupies a footprint of approximately 38 acres. This report presents the results of the installation of five additional ground-water monitoring wells for the monitoring system upgrade as per the Water Quality Monitoring Plan for the Unconstructed Portion.

#### 2.0 OBJECTIVES AND SCOPE

The Water Quality Monitoring Plan for the Unconstructed Portion required the installation of five additional new ground-water monitoring wells, MW-10, MW-11, MW-11D, MW-12; and MW-12D. Three of the five wells were installed within 100 feet from the waste boundary, between the waste boundary and the property boundary. However, wells MW-12 and MW-12D were installed about 170 feet from the proposed waste boundary because a major roadway (Freeman Road) and drainage ditch were located within 100 feet of the waste boundary.

Three 15-foot monitoring well screens were placed at vertical locations for MW-10, MW-11 and MW-12 that would ensure that future drought conditions, which may lower the water table, would not render the monitoring system ineffective.

During October and November 1994, these the shallow monitoring wells (MW-10, MW-11, and MW-12) were installed such that screens were set 1-foot above the seasonal high water table as established in the Water Quality Monitoring Plan. The two deep wells were installed in the saprolite just above bedrock. These wells were set in the residuum/saprolite where first contamination is anticipated to be encountered.

#### 3.0 INSTALLATION

#### 3.1 Soil Test Boring

Standard soil test borings were drilled at the three designated monitoring locations. The soil test borings were advanced into the residuum/saprolite with a 6-1/4 and 4-1/4 inch I.D. hollow-stem augers and sampled using a split spoon sampler at 5-foot intervals. Borings MW-11 and MW-12 encountered auger refusal at 93.5-feet and 43.3 feet respectively. Drilling was stopped there and the well was set. The soil samples were logged for classification purposes. The two shallow wells were set in saprolite in adjacent borings.

#### 3.2 Monitoring Wells

The three boring locations had five ground-water monitoring wells installed at them. The following paragraph describes the installation methods used. A summary of monitoring well construction data is presented in the table. Detailed monitoring well construction logs are included in Appendix B and state well completion records in Appendix C.

Monitoring wells were installed in accordance with the following procedures. All well screens and risers were steam cleaned and the length of each section was measured to the nearest 0.01 foot immediately prior to installation. Personnel handling well materials were required to wear new disposable latex gloves. Well screens and risers for each well consisted of 2.0-inch I.D., flush threaded, Schedule 40 polyvinyl chloride (PVC). Screens were 15 feet in length for the three shallow wells and 10 feet for the two deep wells with 0.010-inch machined slots. Filter pack material, consisting of a washed medium/fine silica sand, was installed to approximately 1-foot above the top of each well screen. Another foot of washed fine silica sand was placed above the coarser sand pack to act as a filter. Then at least a 3-foot thick bentonite pellet seal was placed above the sands and allowed to hydrate for approximately 3/4 hour. Another 6-inch layer of washed fine silica sand was placed above this bentonite seal. Because the top of screen was so shallow in MW-12, some of the minimum thicknesses had to be further reduced to construct a properly functioning monitoring well. Cement-bentonite grout was pumped via tremie pipe from the top of this upper sand layer to the ground surface. The wells were completed with 4-inch lockable

anodized-aluminum protective casings set into a 3 ft. x 3 ft. x 3 in. concrete pads with 4 protective posts.

### 3.3 Well Development

Each well was developed using both surging with a hand pump and a grundfos submersible pump. Development proceeded over 4 days and the total amount of water removed is recorded on the well construction logs in Appendix B. Water samples were tested periodically until the parameters stabilized within acceptable limits.

#### 3.4 Survey

All proposed locations were staked prior to drilling and then each well was surveyed for their state grid coordinates and the top of PVC casing elevation determined using NGVD. All surveying was performed by a crew from Hugh Creed Associates.

#### 4.0 CONCLUSION

These five ground-water monitoring wells were installed with three at the water table and two at the top of rock. All were set in residuum/saprolite as per the Water Quality Monitoring Plan for the Unconstructed Portion. The wells were installed in general accordance with both Waste Management and the North Carolina Well Construction Standards (15A NCAC 2C.0108).

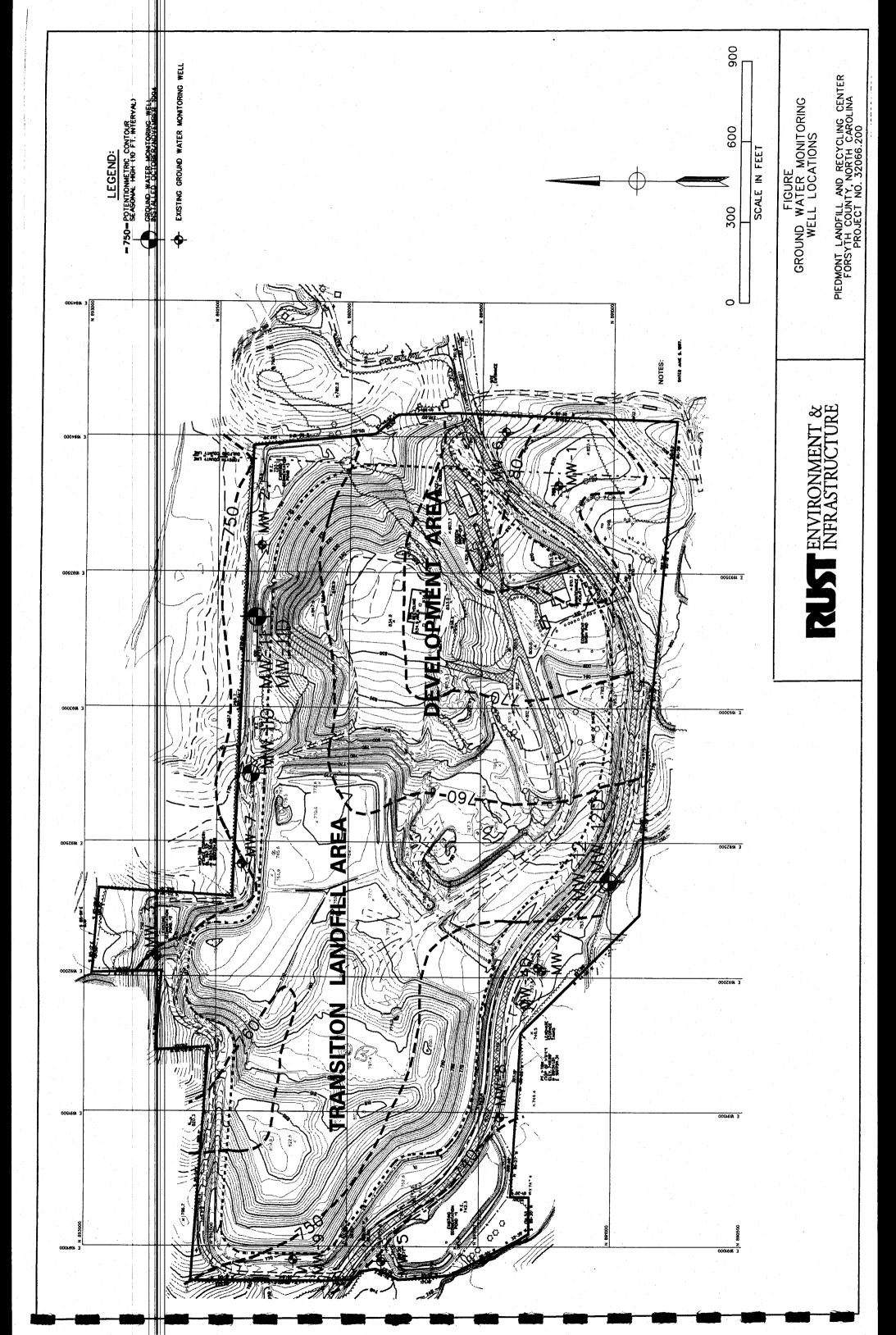
The summary of hydrogeologic characteristics at each well are described as follows. At MW-10, the soils have a porosity of 47 percent and an hydraulic conductivity of  $10^4$  cm/sec. The effective porosity is estimated to be 30 percent. The ground-water flow is then estimated to be 8.6 feet/year in a northerly direction. At MW-11, the soils have a porosity of 55 percent and an hydraulic conductivity of  $10^4$  cm/sec. The effective porosity is estimated to be 30 percent. The ground-water flow is then estimated to be 8.6 feet/year in a northerly direction. At MW-11D, the soils have a porosity of 37 percent and an hydraulic conductivity of  $10^4$  cm/sec. The effective porosity is estimated to be 25 percent. The ground-water flow is then estimated to be 10 feet/year in a northerly direction. At MW-12 the soils have a porosity of 49 percent and an hydraulic conductivity of  $10^4$  cm/sec. The

effective porosity is estimated to be 30 percent. The ground-water flow is then estimated to be 7.2 feet/year in a west-southwesterly direction. At MW-12D the soils have a porosity of 39 percent and an hydraulic conductivity of  $10^{-6}$  cm/sec. The effective porosity is estimated to be 20 percent. The ground water flow is then estimated to be 0.1 feet/year, in a west-southwesterly direction.

TABLE 1

# MONITORING WELL CONSTRUCTION DETAILS PIEDMONT LANDFILL & RECYCLING CENTER KERNERSVILLE, NORTH CAROLINA

Monitoring	State	Ground	T.O.C.	Screen	Sand Pack	Top of
Well	Coordinates	Elevation	Elevation	Elevation (Depth)	Elevation (Depth)	Bentonite Seal
MW-10	N 892,371.2 E 1,692,751.8	774.20	777.20	752.20-737.21 (22.00-36.99)	754.90-736.2 (19.3-38.00)	758.60 (15.60)
MW-11	N 892,349.7 E 1,693,332.9	774.30	776.80	755.29-740.30 (19.01-34.00)	757.20-739.3 (17.1-35.00)	761.60
MW-11D	N 892,356.00 E 1,693,334.00	773.86	776.36	692.04-682.07 (81.82-91.79)	693.86-680.36 (80.0-93.5)	698.86 (75.0)
MW-12	N 891,010.98 E 1,692,354.73	748.58	751.48	745.25-731.55 (3.33-17.03)	746.83-730.58 (1.75-18.00)	748.08 (0.50)
MW-12D	N 891,007.53 E 1,692,360.86	748.73	751.53	716.75-706.73 (31.98-42.00)	724.23-705.43 (24.5-43.3)	735.23 (13.5)



APPENDIX A SOIL BORING LOGS

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d	3	T	SILT (ML)	<u> </u>				Ī								
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	38%		<del></del>													
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. 1			LOCATION		DRILLING METH		5" O.D.	(4.2	5" 1	l.D.)	B	ORING		11	,	1	
		CYCL	ING CE	ENTER - KERNERSVILLE,	HOLLOW	SIEM A	UGEK						1 VV	-11	·		
	NC				SAMPLING MET	HOD: SP	LIT SPC	ON				неет <b>3</b>	OF	F 3	3		
													DRILL				
						,						STAF	RT	FIN	ISH		
					WATER LEVEL						_	TIMI	- 1	TIM			
					TIME							13:0		11:			
	DATUM			elevation <b>774.0</b>	DATE						$\dashv_{\bullet}$	DAT	1	DA 11-1	- 1		
H	ORILL R	11.1	1E-450		CASING DEPTH	CONDITIONS	FILL	(BERI	VI C	DR PH							
1	ANGLE	H-I	rtical	BEARING	CONT. AGE	CONDITIONS		,				,				ECS	
	SAMPL	11	R TORQUE	FTLBS													.
	DEPTH IN FEET <u>(ELE</u> VATION)	6 IN PLER /ERY)		SAMPL	E NUMBER			딾	CASING TYPE	OOT	%				OTHER TESTS: K cm/sec	DRILLING CONTR	DRILLER
	H	WS/ CO/	SOIL		AND			SAMPLER AND BIT	2	VS/F	Z L	~ %	ပ္ %	단	~ ;;	S S	_
	DEPTI (ELE)	BLOWS/6 IN ON SAMPLER %(RECOVERY)	, <u>a</u>	DESCRIPTION	OF MATE	RIALS		SA	CASII	BLOWS/FOOT ON CASING	WATER	LIAUIT	PLASTIC LIMIT %	SPECIFIC GRAVITY	OTHER TESTS:	DRILLI	
<u> </u>	7C.0	<u> </u>	<u> </u>	CANDY OUT OUT					<u> </u>								
	_	9		SANDY SILT (ML) Similar to above.													
		14 26								📲							
		75%															
	<b>- 75</b>			CANDY OUT (MIL)													
	_	11 15		SANDY SILT (ML) Similar to above, some fine gr	avel in quartz	/plagioclas	e veins.			=							
		25 30		Iron stained material adjacent	to veins is cla	y and mice	a.										
		65%								=							
	- 80									]					, i		SL
	_	6 10		No return, only material from	inside augers	ın split spo	on.										
		13															
		15															
	 - 85	0%															
		7		GRAVELY SILT (ML) Hard, orangish brown, white,	moist, mostly	silt, some	fine to										
		23		coarse gravel, quartz/plagiocla													
	-	33		zones.													
	90	55%															
Tracking Codes, Window, 1 Kill dies, Turen	3			CLAYEY SILT (ML) Hard, green, white, remenant clay, green grains altered horr		mostly sil	t, little										
				Boring Terminated at 93.5 ft.												Ä	
	95			• • • • • • • • • • • • • • • • • • •												LC LC	1
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	100										-					흐	
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																LOGGED BY MICHAEL TAYLOR	СНК'D ВҮ
	- 105	d													<u> </u>	Ŋĕ	동

C	ľ	YCLII	NG CE	NTER - KERNERSVILLE,	STEM /	AOGEN					SH	EET		<u>-12</u>		
					SAMPLING	метнор: <b>SP</b>	LIT SPO	ON				1	OF	= 2	2	
													DRILL			ш
							<u> </u>					STAR			ISH	CURRIE
					WATER LE	VEL					$\dashv$ .	TIME 0:00			ме : <b>40</b>	Ŋ
		İ			TIME						'	DATI	-		TE	
	ı			ELEVATION 749.0	CASING DI	рти					10	DAII 0-21			1-94	Σ
TUM ILL RI		CM	F 850	Track Mount		ACE CONDITIONS	GRAS	SS/FO	RE	ST			<u> </u>			GRAHAM &
GLE	1	<del></del>	tical	BEARING	- 00											R
		+	TORQUE	FTLBS		. 44.3****	****									
(ELEVATION)	DI CIVICIE IN	BLOWS/6 IN ON SAMPLER %(RECOVERY)	SOIL		LE NUME AND N OF MA			SAMPLER ANID BIT	CASING TYPE	BLOWS/FOOT ON CASING	WATER CONTENT %	LIQUID LIMIT %	PLASTIC LIMIT %	SPECIFIC GRAVITY	OTHER TESTS: K cm/sec	DRILLING CONTR
0.0	<del></del>	3 3 4 7		SANDY SILT (ML) Medium stiff, brown, little oa little fine to medium quartz s												
5		1 1 2 3		SILTY CLAY (CL) Soft, gray, moist to wet, mo- little mica, 2" fine gravel laye		ome silt, little	fine sand,			ագույրուրակարևությունուրուրուրակարևուրուրուրուրուրուրուրուրուրուրուրուրուրո						
10		1 2 1 2		SILTY SAND (SM) Similar to above, but wet. SILTY SAND (SM) Very stiff, dark gray brown,	wet, fine s	and with silt, s	some mica									
- 15		22 47		grading into SAPROLITE -												
- - - - 20		50/4"		SANDY SILT (ML)  Dense, brown with white an with medium to coarse sand black appears to be weather saprolite.	, 6 veins of	quartz and pl	agioclose,									
- - - - 25		1 5		SILTY SAND (SM)										i i i i i i i i i i i i i i i i i i i		YYLOR
- - - - 30		9 8		Medium stiff, brownish black little medium grain sand, little grain.				*								LOGGED BY MICHAEL TAYLOR
-		50/3"		SILTY GRAVEL (GM) Very dense, brown, black m gravel, some silt, little sand, - SAPROLITE -	ottled whit with few r	e, moist, mos nica.	tly fine									GGED BY M

		1	ocation NG CE	PIEDMONT LANDFILL NTER - KERNERSVILLE,	DRILLING METH		25" I.D.	. HOLI	LOW		BORING N SHEET		-12			
NC					SAMPLING MET	нор: SP	LIT SPO	OON			2			<u>.                                    </u>		
											STAI	DRILL	ING	SH	RIE	
					WATER LEVEL						TIM 09:0	ļ	TIM 16:4	-	CUF	
DATUN			•	ELEVATION <b>749.0</b>	DATE CASING DEPTH	4					DAT	t	DA1		GRAHAM & CURRIE	
DRILL	<del>   </del>	+		Track Mount	<del>'</del>	CONDITIONS	GRA	SS/FC	REST						AHA	
ANGLE	<del>                                      </del>	+	tical TORQUE	BEARING FTLBS										,		, l
DEPTH IN FEET (ELEVATION)		ON SAMPLER %(RECOVERY)	SOIL		E NUMBER AND N OF MATI			SAMPLER AND BIT	CASING TYPE BLOWS/FOOT ON CASING		CONTENT %	PLASTIC LIMIT %	SPECIFIC GRAVITY	OTHER TESTS: K cm/sec	DRILLING CONTR	DRILLER
35.0				SILTY GRAVEL (GM) Very dense, brown, black mo gravel, some silt, little sand, v			ly fine		mlumlumlumlumlumlumlumlumlumlumlumlum							
40																
				- SAPROLITE -	·											·
45				Boring terminated at 43.3 ft.												S
50															.	
	ALL DESCRIPTION OF THE PARTY AND THE PARTY A							-								
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2066,																
) see,															R	
60															TAYLC	
65											-				LOGGED BY MICHAEL TAYLOR	
															ер ву М	, BY
70.	o														DDOT	CHK'D BY

APPENDIX B
MONITORING WELL CONSTRUCTION SUMMARY

Well No.: MW-10 Boring No. X-Ref: MW-10 MONITOR WELL CONSTRUCTION SUMMARY Elevation Ground Level: 774.20 Survey Coords: N892,371.2 KERNERSVILLE, NC PIEDMONT LANDFILI Top of Casing: E1.692.751.8 **Construction Time Log: Drilling Summary:** Start Date Date | Time Task Time 38.0 ft. Total Depth: \_\_ **Drilling HSA** 10/24/94 09:20 10/24/94 14:45 11 in. Borehole Diameter: Casing Stick-up Height: \_\_\_ 3.00 ft. Driller: Graham & Currie Geophys. Logging: Casing: 10/24/94 14:46 10/24/94 14:48 CME-850 SITE NAME Bit(s): 6.25" I.D. HSA Drilling Fluid: \_\_\_\_\_ Filter Placement: 14:50 10/24/94 16:04 10/24/94 Bentonite Seal: 10/24/94 16:32 Protective Casing: 5.0' x 4.0" x 4.0" 10/24/94 16:06 Anodized Aluminum Development: 11/15/94 08:03 11/17/94 15:12 **Well Design & Specifications** Basis: Geologic Log: \_X\_ Geophysical Log: \_\_\_ Casing String (s): C = Casing S = Screen Well Development: 11/15/94 08:03 - 18:00, Displacement Pump (0.3) String(s) Depth Elevation 11/17/94 14:42 - 15:12, Grundfos Pump (0.4) 22.00 - +3.00 752.20 777.20 36.99 - 22.00 7<u>37.2</u>1 - 752.20 Total pumped approximately 200 gallons 7<u>37.0</u>1 - <u>737.2</u>1 37.19 - 36.99 Stabilization Test Data: Spec. Cond. Temp (C) Time рΗ 5' x 4" x 4" Anodized 78 14 Casing: C1\_\_ 14:45 5.64 Aluminum 15 14:50 5.64 77 2" I.D. Flush Threaded Sch. 5.53 77 15 14:55 40 PVC 5.52 77 15 15:00 S1 2.0" I.D. 0.010" Slot Sch. 40 PVC Screen: MIKE TAYLOR P1 2.0" I.D. PVC Plug Recovery Data: None So = Q= Filter Pack: 38 - 20.8 Med. Sand 100 20.8 ft. 19.3 Fine Sand 15.6 - 14.4 Fine Sand С О 60 Grout Seal: 14.4 to 0.0 ft. Bentonite/ ΒΥ: RY 40 cement grout SUPERVISED Bentonite Seal: 19.3 ft. to 15.6 ft. Bentonite pellets 20 80 100 ( . Comments: Water cleaned up after surging well during development.

Well No.: MW-11 Boring No. X-Ref: \_\_\_\_MW-11 MONITOR WELL CONSTRUCTION SUMMARY Elevation Ground Level: 774.30 Survey Coords: <u>N892.349.7</u> Top of Casing: 776.80 E1.693.332.9 **Construction Time Log: Drilling Summary:** Finish Start Date Time Date Time Task 35.0 ft. Total Depth: \_\_ 11<u>/17/94</u> Drilling 09:56 11/17/94 8.5 in. 07:55 Borehole Diameter: \_\_ 2.50 ft. Casing Stick-up Height: \_ Geophys. Logging: Casing: 11/17/94 10:05 11/17/94 10:07 CME-45 Bit(s): 8.25" I.D. HSA Drilling Fluid: Filter Placement: 11:04 11/17/94 10:12 11/17/94 11/17/94 11:10 Bentonite Seal: 11/17/94 5.0' x 4.0" x 4.0" Protective Casing: Anodized Aluminum Development: 14:30 11/18/94 16:32 11/18/94 **Well Design & Specifications** Basis: Geologic Log: \_X\_ Geophysical Log: \_\_\_ Casing String (s): C = Casing S = Screen Well Development: 11/18/94 14:30 - 16:32, Displacement Pump (0.3) String(s) Elevation Depth C1 C2 755.29 - 776.80 19.01 - +2.50 7<u>40.3</u>0- <u>755.2</u>9 S1 34.00 - 19.01 Total pumped approximately 40 gallons 740.08 - 740.30 34.22 - 34.00 P1 Stabilization Test Data: Spec. Cond. Temp (C) рΗ Time 15 72 5' x 4" x 4" Anodized 15:35 6.76 Casing: C1\_\_\_\_\_ Aluminum 15 15:47 6.54 69 C2 2 in, I.D. Flush Threaded Sch. 71 15\_ 6.53 16:15 40 PVC 15 67 6.57 16:23 Screen: S1 2.0" I.D. 0.010" Slot Flush Threaded Sch. 40 PVC Recovery Data: None 2.0" I.D. Flush Threaded Sch. 40 PVC Q=  $S_0 =$ Filter Pack: 100 35.0 - 17.5 Med. Sand RE 80 17.5 ft. - 17.1 Fine Sand C 12.7 - 12.2 Fine Sand Grout Seal: 12.2 to 1.0 ft. Bentonite Quik RY 40 gel/cement mix Bentonite Seal: 17.1 ft. to 12.7 3/8 ft. Bentonite pellets 80 20 60 TIME ) Comments: \_ Water cleaned up after surging well during development.

MIKE TAYLOR SUPERVISED BY: CWM Mont. Well

PIEDMONT LANDFILL KERNERSVILLE, NC

SITE NAME LOCATION

Well No.: MW-11D Boring No. X-Ref: MW-11 MONITOR WELL CONSTRUCTION SUMMARY Elevation Ground Level: 773.86 Survey Coords: N892,356.00 PIEDMONT LANDFILL Top of Casing: 776.36 E1.693.334.00 **Construction Time Log: Drilling Summary:** Finish Date | Time Date Time Task 93.5 ft. Total Depth: \_\_\_ Drilling HSA 11/15/94 11:28 8.5 in. 11/14/94 13:06 Borehole Diameter: \_\_ 2.50 ft. Casing Stick-up Height: \_\_ Geophys. Logging: Casing: Rig: CME-450 11/15/94 13:16 11/15/94 13:20 SITE NAME Bit(s): 8.5" I.D. HSA Drilling Fluid: Filter Placement: 11/16/94 13:53 11/15/94 17:01 Bentonite Seal: 11/16/94 14:06 11/16/94 14:18 Protective Casing: 5.0' x 4.0" x 4.0" Anodized Aluminum Development: 11/18/94 13:35 11/18/94 07:26 Well Design & Specifications Basis: Geologic Log: \_X\_ Geophysical Log: \_\_\_ Casing String (s): C = Casing S = Screen Well Development: 11/18/94 07:26 - 13:35, Displacement Pump (0.1) Depth String(s) Elevation C1 81.82 - +2.50 C2 692.04 - 776.36 91.79 - 81.82 682.07-692.04 **S1** Total pumped approximately 40 gallons 92.00 - 91.79 P1 681.86 - 682.07 **Stabilization Test Data:** Spec. Cond. Temp (C) Time pН 109 18 Casing: C1 \_\_\_\_\_5' x 4" x 4" Anodized 08:00 7.08 Aluminum 08:25 6.85 84 15 2" I.D. Flush Threaded Sch. 08:37 7.07 6.93 40 PVC 10:30 Screen: S1 2.0" I.D. 0.010" Slot Flush 16 6.94 10:54 P1 Threaded Sch. 40 PVC 6.98 12:13 Recovery Data: None 2.0" I.D. Flush Threaded Sch. 40 PVC Filter Pack: 100 r 93.5 ft. - 80.5 ft. Medium Sand RE 80 C O\_60 80.5 ft. - 80.0 Fine Sand 75.0 - 74.4 Fine Sand RY 40 Grout Seal: 174.4 to 1.0 ft. Bentonite/cement Bentonite Seal: 80.0 ft. to 75.0 ft. Bentonite pellets (3/8" hole plug) 20 TIME ( Comments: \_\_\_\_\_ Water did not really clear up during development.

KERNERSVILLE, NC

MIKE TAYLOR

BY:

SUPERVISED

CWM Mont. Well

Well No.: \_\_\_\_MW-12\_\_\_ Boring No. X-Ref: MW-12 MONITOR WELL CONSTRUCTION SUMMARY Elevation Ground Level: Survey Coords: <u>N891.010.98</u> 748.58 Top of Casing: 751.48 E1.692.354.73 **Drilling Summary: Construction Time Log:** Start Finish Task Date | Time Date | Time 18.0 ft. Total Depth: \_\_\_\_\_ Drilling HSA 10/21/94 11:08 Borehole Diameter: 11.0 in. 10/21/94 09:04 Casing Stick-up Height: 2.90 ft. Driller: Graham & Currie Geophys. Logging: CME-850 Casing: Bit(s): 6.25" I.D. HSA Drilling Fluid: Filter Placement: 10/21/94 12:19 10/21/94 11:16 Protective Casing: 10/21/94 12:26 Bentonite Seal: 3.8' x 4.0" x 4.0" 10/21/94 12:23 Anodized Aluminum Development: 1/16/94 17:41 11/17/94 18:20 **Well Design & Specifications** Basis: Geologic Log: \_X\_ Geophysical Log: \_\_ Casing String (s): C = Casing S = Screen Well Development: 11/16/94 17:41 - 20:09, Displacement Pump (0.8) String(s) Depth Elevation 11/17/94 17:22 - 18:20, Displacement Pump (0.9) C2 745.25 751.48 3.33 - +2.90 17.03 - 3.33 S1 731.55 745.25 Total pumped approximately 170 gallons <u>17.22 - 17.03</u> P1 7<u>31.3</u>6- <u>731.5</u>5 Stabilization Test Data: Temp (C) 60 Spec. Cond. Casing: C1 3.8' x 4" x 4" Anodized 11/16/94 18:41 15\_ 6.14 129 Aluminum 19:10 5.98 129 15 C2 2" J.D. Flush Threaded Sch. 15 6.24 127 \_19:54 40 PVC 11/17/94 S1 2.0" I.D. 0.010" Sch. 40 PVC Screen: 18:11 6.15 126 15 170 P1 2.0" I.D. PVC Plug Recovery Data: None  $S_0 =$ Filter Pack: \_ 100 18.00 ft. - 3.33 ft. Medium Sand RE 80 3.33 ft. - 1.75 Fine Sand O 60 VE Grout Seal: 0.50 ft. to 0.00 ft. Bentonite cement/arout Bentonite Seal: 1.75 ft. to 0.50 ft. Bentonite 100 60 80 TIME ( Comments: Surface seal = 3.0 ft. x 3.0 ft. x 3 in. Concrete pad with protective post. Water did not clear up when developing well.

PIEDMONT LANDFILL KERNERSVILLE, NC

SITE NAME

MIKE TAYLOR

ΒΥ:

SUPERVISED

						Boring I			MW-12 MW-1		
			MONITOR	WELL CONST	RUCTIO	ON SU	MMA	RY			
0			Survey Coords:	N891,007.53	Elevation	Ground L	.evel: _	7	48.73		
1		1		1.692.360.86		Top of Ca	asing:	7	51.53		. 1
8			Drilling Summary:			ction Tim	St	art	Fin		
Ħ	4.	<del>\</del>	Total Depth:	43.3 ft.	Task		Date	Time	Date	Time	
N		$\mathbb{N}$	Borehole Diameter:		1	3 1/4" HSA	1		10/21/94	1	
N		M	Casing Stick-up Height:		6 1/4" HS	Α	10/24/94	12:53_	10/24/94	16:36	
N.		M	Dillier Grand	iii & Odine							
$\square$		$\square$			Geophys.	Logging:					
			Rig: CM		Casing:		10/24/94	16:40	10/24/94	16:42	
			Bit(s): 6.25"	I.D. HSA	·		<u> </u>		ļ		
			Drilling Fluid:	N/A							
lΕ					Filter Plac		10/24/94	16:48	10/24/94		
LE			Protective Casing: Anodized Al	5.0' x 4.0" x 4.0"	Bentonite		10/24/94	-	10/24/94		ļ · · · ˈ
ΙĒ			Well Design & Specific		Developm	ient:	11/16/94	08:26	11/17/94	15:23	
ΙĘ			Work Booligh & Opcomo								
H			Basis: Geologic Log: _X	_ Geophysical Log:	,			-			
			Casing String (s): C = Casi	ng S = Screen	Well Dev	/elopmen	t:				
					11/16/94	<u>08:26 - 16:</u>	30, Displ	acemen	t Pump ((	).15)	
			Depth Strin			17:30 - 19:	-				
			31.98 - +2.80 C2		11/17/94	07:49 - 15:	23, Displ	acemen	t Pump		
			42.00 - 31.98 S1	I I	5					•	
-			42.20 - 42.00 P1	<u>706.53</u> - <u>706.73</u>		nped appro ation Test		170 galie	ons		
					Time	рН	Spec. (	Cond.	Tem	ıp (C)	
			Casing: C15.0'		18:27	6.03			1	15	
			C2 2" LD FI	Aluminum ush Threaded Sch.	18:44	6.18	19			6	-
				40 PVC	19:15 19:31	6.21 6.22	19 19	<u>)2</u> 91		15 15	1
			Screen: S1 2.0" I.D. 0	010" Sch. Slot Sch.	10.01	0.22	<u>.</u> .				1
			P1 2.0" I.D. P	/C Plug	Recover	y Data:					
			Filter Pack:	·	100	Q=	Sc	) = 	, ,,	<del></del>	
			43.3 ft 29.1 ft. Mediu		% RE 80						
			29.1 ft 24.5 Fine San		C 60						
			13.5 ft 13.0 Fine Sand Grout Seal: 13.0 ft 0.0		I VE						
			cement/grout		RY 40			† †			
			Bentonite Seal: 24.5 ft. t		20		+		+ +	$\Box$	
			pellets		0	20	40	60	80	100	
						TIME	(	)			
			Comments:								
				20ft vain Comercia	anad with in	rotoctive =	oete				
			Surface seal = 3.0 ft. x	3.υ π. x 3 m. Concrete	: pau with pi	Olective D	<b>USIS</b> .				
			<u> </u>			· · ·			•	<del> </del>	
		<del>, '''</del>	Grundfos pump cause	d well to go dry fast at	low pumpin	g rates.		- '			1

APPENDIX C
MONITORING WELL COMPLETION RECORDS

ME OF SITE				PERMIT NO	).:	<del></del>
		fill & Recycling Center		34-6		
10 RESS 9900	Freeman F	Road, Kernersville, NC 2728	4	OWN Wast	ER (print): ce Managemen olinas, Inc.	t of
ILLING CON Graha		e Well Drilling Inc.		REGISTRAT	UON NO":	
ng Type: ng Depth: en Type: en Depth: lc Water Lev	from ±3	Sch. 40 dia. 2 in 3.00 to 22.00 (t dia. 2 in 2.00 to 36.99 ft dia. 1 in 12.00 to 36.99 ft dia. 1	Benjonite Seal	e from	•	$\frac{3}{0} \text{ ft dia.}  = \\ \frac{0}{1} \text{ ft dia.}  = \\ \frac{1}{1}  ft.$
	· · ·	thod of Testing: N/A		Casing	Date Mean tis +3.00	feet above land
	DRI	LLING LOG		LOCA	TION SKETCH	
OM DEPT	H TO	FORM (4 FIGURE DECORPORATION AND ADMINISTRATION AND	(show distance		i roads, or other	
, ,,,,,	8'	FORMATION DESCRIPTION Silt (ML) stiff brownish	1			
		orange FILL	<del>'</del>			
	<del></del>	or ungo	-		1.3.	. •
	35 '	Silt (ML) stiff to very		ee attache	d location	olan
		stiff brown orange,	1			•
		yellow, black mostly	11		••	
The state of the s		silt little clay	11			•
		SAPROLITE				
		•	11	•		
			11	•		
		f	11			
		*****	11		•	
		<del></del>	┩┞┈┈┈			
ARKS:						,

ME OF S	ITE:	PERMIT NO.:
	edmont Landfill & Recycling Center	34-6
	00 Freeman Road, Kernersville, NC 27284	OWNER (print): Waste Management of Carolinas, Inc.
	CONTRACTOR:	REGISTRATION NO.:
Kr	nvironmental Construction Services Inc.	MW-11
ing Type ing Depti ion Type ion Depti	: PVC Sch. 40 die. 2 in. h: from 19.01 to 34.00 ft. die in.	Grout Depth: from 0.0 to 12.2 ft dia. 8.5"  Bentonite Seal: from 12.7 to 17.1 ft dia. 8.5"  Sand/Gravel PK: from 17.1 to 35.0 ft dia. 8.5"  Total Well Depth: from +2.50 to 34.2 ft dia. 8.5"
ric Water	Level: 27.58 feet from top of casing	Date Measured 11 / 18 /
d (gp <b>e</b> i):	N/A Method of Testing: N/A	Casing is +2.50 (cet above land sur
	DRILLING LOG	LOCATION SKETCH
	<u>ертн</u>	(show distance to numbered roads, or other map reference poi
ROM	TO FORMATION DESCRIPTION	
) <u>'</u>	13' Sandy silt and silty	
	sand (ML/SM) stiff/loose	
	olive brown dry soils	See attached location plan
	FILL	
131	35' Silt (ML) predominately	
	stiff mottled white	
	black, orange silt	
	to sandy silt	
	SAPROLITE	
	SAPROLITE	
	1.	
MARKS:	The state of the s	

ora EMIL	ire:	PERMIT NO.:
<b>.</b>	edmont Landfill & Recycling Center	
DINESS	comore Editarri a Recycring Center	34-6
	00 Freeman Road, Kernersville, NC 27284	OWNER (print): Waste Management of Carolinas, Inc.
	CONTRACTOR:	REGISTRATION NO.:
	vironmental Construction Services, Inc.	∖ MW−11D
ing Type ing Desi en Type en Desi ic Water	h: from +2.50 to 81.82 ft dia in. PVC Sch. 40 dia 2 in.	
d (gpm):	N/A Method of Testing: N/A	Date Measured 11 / 18
	t telling:	Casing is +2.50 feet above land so
	DRILLING LOG	I COATTON OF THE
	РТН	LOCATION SKETCH (show distance to numbered roads, or other map reference po
MOM	TO FORMATION DESCRIPTION	to transfer to the transfer of other map reference po
	13' Sandy silt and silty	
	sand (ML/SM) stiff/loose	
	olive brown dry soils	See attached location plan
	FILL	Total desired recueron prun
3 '	93.5' Silt (ML) predominately	
	stiff to hard mottled	
	white, black, orange	
	silt to sandy silt	
	with few clay lenses	
1 i III.	SAPROLITE	

NE OF SITE:	PERMIT NO.:
Piedmont Landfill & Recycling	taran da araba da ar
9000 Freeman Road, Kernersvill	e. NC 27284 OWNER (print): Waste Management of
DRILLING CONTRACTOR:	Carolinas, Inc.
Graham & Currie Well Drilling	Inc. MW-12
rom +2.90 to 3.33 (t  PVC Sch. 40  PVC Sch. 40  from 3.33 to 17.03 ft  tall: Water Level: 6.02 feet from to	lia. 2 in. Sand/Gravel PK: from 1.8 to 18.0 ft. dia. 11 lia. in. Total Well Depth: from +2.90 to 17.2 ft. dia. 11 p of casing  Date Measured 11 / 16 /
ield (gpm) N/A Method of Testing:	Casing is +2.90 feet above land su
DRILLING LOG	LOCATION SKETCH
DEPTH	(show distance to numbered roads, or other map reference poi
FORMATION DE	SCRIPTION
0' 18' Sandy silt, s	lty clay,
silty sand (M	, CL, SM).
Gradational be	tween soil See attached location plan
types and is o	
On weathering	mottled
brown orange w	hite
black	
SAPROLITE	
	<del></del>
MARKS:	
21 1 E III I	

COMPLET DEPARTA	ALLINFORMATION REQUESTED BELOW FOR IEN'T OF HUMAN RESOURCES, SOLID A 2091, RALEIOH, N.C. 27602	REACH WELLINSTALLED, AND RETURN FORM TO THE NAME OF TH
	771 RACEION, N.C. 27602	
VALUE OF S	rie:	1
Pi	edmont Landfill & Recycling Center	PERMIT NO.:
ADDRESS:	Recycling Center	34-6
99	🌓 Freeman Road, Kernersville, NC 27284	OWNER (print): Waste Management of
!!!!!!	DNTRACTOR:	Carolinas, Inc.
Gr	Mham & Currie Well Drilling Inc.	MW-12D
asing Type:  Type:  Type:  Teen Depti	from ±2.80 to 31.98 ft dia in	Grout Depth: from 0.0 to 13.0 ftdia. 11"  Bentonite Seal: from 13.5 to 24.5 ftdia. 11"  Sand/Oravel PK: from 24.5 to 43.3 ftdia. 11"  Total Well Depth: from +2.80 to 42.2 ftdia. 11"
	teet from top of casing	Date Measured 11 / 16 /94
ela (gpm):	Method of Testing: N/A	Casing is +2.80 feet above land surf
DE	DRILLING LOG	LOCATION SKETCH
FROM	TO FORMATION DESCRIPTION	(show distance to numbered roads, or other map reference point
0	43.3' Sandy silt, silty clay,	
	silty sand silty gravel	
	(ML, CL, SM, GM)	
	Gradational between soil	See attached location plan
	types and is dependent	
	On weathering Mottled	
	brown orange white black	
	SAPROLITE .	
		•
	1	
MARKS:		
12/	16/94 SIGNATURE:	
3147 (KAHS)	our Mainer wenn Prench	

